Applicant has amended claims 1, 7, 9, and 15 to more clearly define the invention. The amendments to the claims clearly recite an aspiration scheme having a selectable aspiration rate ranging from a gentle aspiration to vigorous aspiration. Such aspiration includes aspiration which provides for a range of results with respect to nucleic acid sample shearing. As has been argued in previous responses, the motivation to combine Vogel into the rejection is indicated to be reduction in shear forces that could damage a nucleic acid sample. However, the art is of two voices, since shearing sometimes is used and sometimes not used. As amended, claims 1, 7, 9, and 15 explicitly recite multiple different aspiration speeds, which creates in certain instances gentle, non-shearing aspiration, and in other instances creates vigorous, shearing aspiration. It is the selectability of the aspiration rate which further improves the nucleic acid isolation process, as opposed to the cited art, which only indicates and is a proponent of gentle mixing or aspiration to avoid shearing. See specification page 6, lines 27-29:

"Mixing is accomplished at various levels from gentle to vigorous. Mixing may be accomplished by any number of processes including physical agitation and a combination of aspirating and dispensing."

Gentle mixing allows the sample being mixed to avoid shearing. However, the vigorous mixing also indicated in the specification allows shearing to occur. The automated processes and apparatuses of the claimed invention allow the control of such mixing to accomplish either shearing or no shearing as is required or desired by the user or the process. This controlled release and controlled aspiration allows control over shearing versus non-shearing forces in the claimed processes and apparatuses. For this reason, the combination of references including Vogel teaches but one aspect of the present claims, and in fact teaches away from another aspect. Indeed, the cited references do not recognize all the advantages of the claimed automated system.

The rejection appears to take one of two potential paths. The art itself is of two opinions, namely the advantages of non-shearing mixing and of shearing mixing. Because the art is of two different voices, it is an arbitrary choice made to follow one path or the other in the rejection. There is therefore no motivation to combine the references in the manner they

have been combined. It is happenstance why the Office Action chooses one available path over the other path. For example, the Vogel et al. reference teaches gentle aspiration to avoid shearing. However, shearing is used in nucleic acid aspiration in many ways, for example by vigorous pipetting. U.S. Patent No. 5,863,755 (Schlessinger et al.) teaches some of the advantages of shearing as they relate to DNA. See Schlessinger, column 25, lines 52-58:

> The purified cDNA is fragmented (by ***shearing,*** endonuclease digestion, etc.) to produce a pool of DNA or cDNA fragments. DNA or cDNA fragments from this pool are then cloned into an expression vector in order to produce a genomic or cDNA library of expression vectors whose members each contain a unique cloned DNA or cDNA fragment.

Applicant reiterates that the previous rejections contain no disclosure of the various modules and computer readable instructions that are recited in claims 6 and 14. As such, Applicant submits that the rejections of those claims are still defective.

Further, the nature of the claimed subject matter is that it is suitable for defining any number of nucleic acid isolation protocols, as has been described in the specification. Applicant submits that the specific modules of claims 7 and 15 are not disclosed anywhere in the cited art, and as such, requirements of a prima facie case of obviousness, namely the presence of each and every element of the claim, have not been met, and the rejections of those claims are also improper for that reason.

Applicant respectfully submits that claims 1-7, 9-10, and 14-18 are allowable.

The remaining claims depend from and further define one of independent claims 1, 6, 8, or 14, and are also believed allowable.

CONCLUSION

Claims 1-19 remain pending in the application. The amendments narrow the issues present in the application, and Applicant believes the amendments place the claims in condition for allowance. Applicant believes that all of the claims are in condition for allowance and respectfully requests a Notice of Allowance be issued in this case. If the

Examiner has any questions regarding this application, please contact the undersigned attorney at (612) 312-2203.

Respectfully submitted,

Date: 11 Jan 2002

Daniel J. Polglaze
Reg. No. 39,801

Attorneys for Applicant
Fogg Slifer Polglaze Leffert & Jay
P.O. Box 581009
Minneapolis, MN 55458-1009

Telephone: 612-312-2200
Fax: 612-312-2250
Direct Phone: 612-312-2203

Marked Up Version Showing Changes Made

In the Claims

1. (Amended) A computer readable medium for controlling the operation of an automated machine, the computer readable medium comprising machine readable instructions for causing a computer to perform a method comprising:

issuing a command set to initiate a plurality of nucleic acid isolation functions by a nucleic acid isolation apparatus, wherein the nucleic acid isolation functions comprise:

loading a vessel into a centrifuge;

centrifuging a sample;

aspirating a sample at a selectable aspiration rate from gentle to vigorous;

mixing a sample;

dispensing into a sample;

controlling the temperature of a function;

removing material from a sample;

separating a sample; and

removing and separating a sample.

7. (Amended) The computer system of claim 6, wherein the computer readable medium comprises:

a software module comprising:

a centrifugation sub-module for issuing commands initiating centrifuging of a sample for a centrifuge time and a centrifuge speed;

an aspiration sub-module for issuing commands initiating aspirating a sample at a selectable aspiration speed ranging from gentle to vigorous to remove a volume of fluid from a sample;

a mixing sub-module for issuing commands initiating mixing a sample;

a dispensing module for issuing commands initiating dispensing into a sample an amount of a specific reagent;

a temperature control module for issuing commands to control the temperature of a function;

a removal module for issuing commands to remove material from a sample;

a separation module for issuing commands to separate a sample into components; and

a combination removal and separation module for issuing commands to control separating and removing a sample.

9. (Amended) A control module for controlling the operation of an automated nucleic acids isolation apparatus, the module comprising:

a processor; and

a program module comprising a set of machine readable instructions for issuing commands to the automated nucleic acids isolation apparatus to perform a series of steps, comprising:

centrifuging a sample;

aspirating a sample at a selectable aspiration rate from gentle to vigorous;

mixing a sample;

adding a reagent to the sample;

controlling the temperature of an isolation function;

removing material from a sample;

separating a sample; and

separating and removing a sample.

15. (Amended) The computer module of claim 14, wherein the plurality of sub-modules comprises:

a centrifuge sub-module for issuing commands initiating centrifuging of a sample for a centrifuge time and a centrifuge speed;

an aspirate sub-module for issuing commands initiating aspirating a sample at a selectable aspiration speed ranging from gentle to vigorous to remove a volume of fluid from a sample;

a mixing sub-module for issuing commands initiating mixing a sample;

a dispensing module for issuing commands initiating dispensing into a sample an amount of a specific reagent;

a temperature control module for issuing commands to control the temperature of a function;

a removal module for issuing commands to remove material from a sample;

a separation module for issuing commands to separate a sample into components; and

a combination removal and separation module for issuing commands to control separating and removing a sample.